

Education and certification of secondary teachers

Concern about the quality of education in the United States has focused interest on teacher qualifications and student exposure to well-qualified teachers, especially in the core subject areas: English, mathematics, natural sciences, and social sciences. Educational background is one measure of teachers' qualifications. Whether teachers either majored or minored or are certified in the fields they teach is an indication of their substantive and academic qualifications in those subjects.

- In school year 1993–94, 15 to 32 percent of public secondary students and 11 to 36 percent of private secondary students were taught the core subjects by teachers who did not major in that subject at the undergraduate or graduate level. Students in mathematics classes were more likely than students in any other core subject to be taught by a teacher who did not major in that field.
- Public secondary students were more likely than private secondary students to be taught science by teachers who had not majored in science.
- Students at public secondary schools with a high poverty level (more than 40 percent of students eligible for free or reduced-price lunch) were more likely to be taught any of the core subjects by a teacher who had not majored in that subject than were students at public secondary schools with a low poverty level (5 percent or less eligible for free or reduced-price lunch) (see supplemental table 58-1).
- Students at public secondary schools with a high percentage of minority enrollment (50 percent or more) were more likely to be taught English and mathematics by teachers who had not majored in those subjects than were students at secondary schools with a low percentage of minority enrollment (4 percent or less). However, students at both types of schools were equally likely to be taught social sciences and science by teachers who had not majored in those subjects (see supplemental table 58-2).

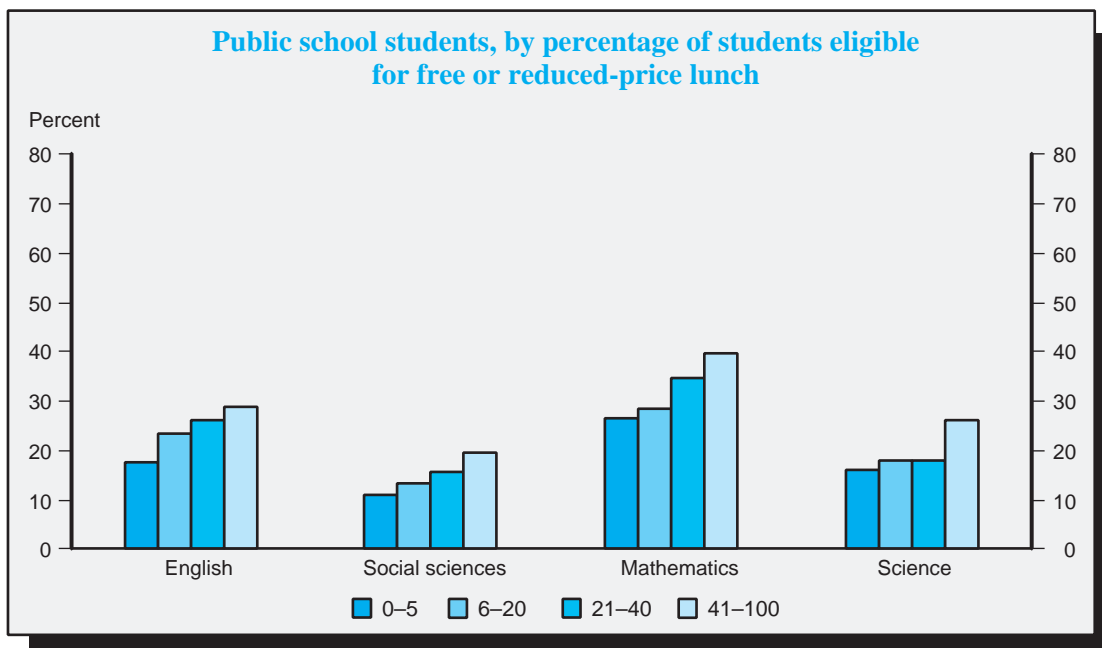
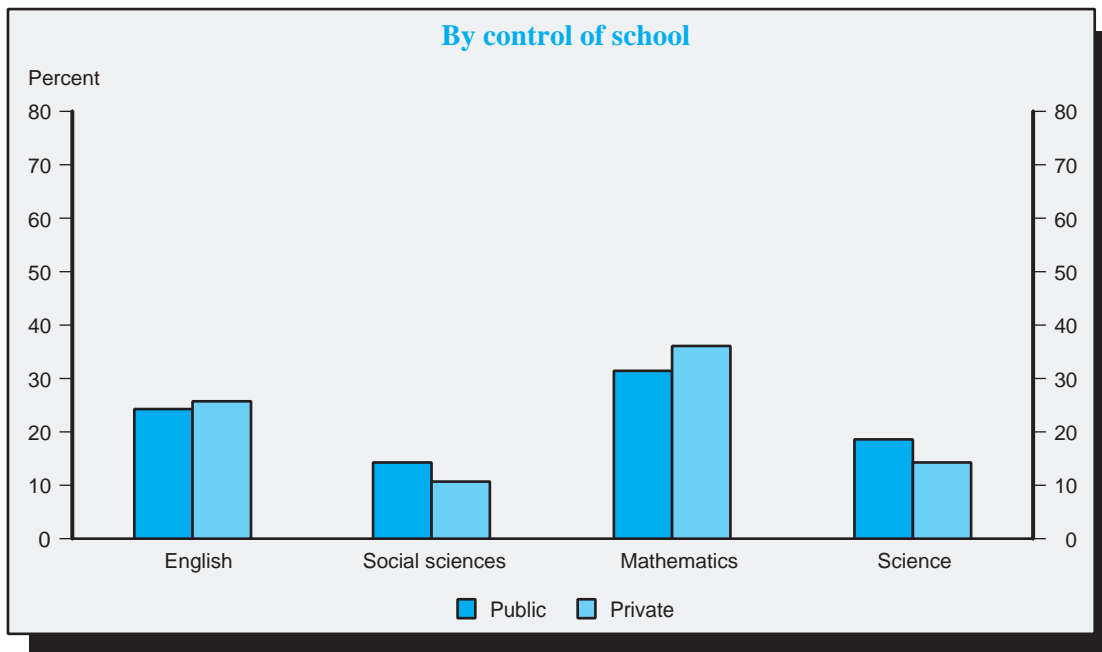
Percentage of secondary students in selected subjects taught by teachers without selected qualifications, by control of school and class subject: School year 1993–94

Control of school and class subject	Did not major in class subject	Did not major or minor in class subject	No graduate degree in class subject	Not certified in class subject
Public				
English	24.4	16.3	75.6	9.6
Social sciences	14.6	8.2	70.2	11.2
Mathematics	31.7	21.7	80.2	14.2
Science	18.9	9.7	71.6	8.9
Foreign languages	18.7	10.5	73.5	11.3
Visual and performing arts	13.7	12.4	68.0	12.4
Health and physical education	8.7	6.7	76.8	8.3
Vocational education	19.2	17.2	76.5	11.5
Private				
English	25.8	20.9	72.1	35.0
Social sciences	11.0	8.8	70.2	31.7
Mathematics	36.2	28.6	82.0	46.4
Science	14.6	8.2	69.8	29.9
Foreign languages	30.7	23.7	72.9	46.7
Visual and performing arts	17.0	13.8	61.7	38.7
Health and physical education	23.9	15.5	76.4	37.0
Vocational education	45.8	43.8	81.7	50.0

NOTE: See the supplemental note to this indicator for the definition of student percentages, certification in class subject, and major/minor in class subject.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1993–94 (Public and Private School Teacher questionnaires).

**Percentage of secondary students in selected subjects taught by teachers
who did not major in the class subject: School year 1993–94**



NOTE: See the supplemental note to this indicator for the definition of student percentages, certification in class subject, and major/minor in class subject.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1993–94 (Public and Private School Teacher questionnaires).

Table 58-1 **Percentage of public secondary students in selected subjects taught by teachers without selected qualifications, by percentage of students eligible for free or reduced-price lunch and class subject: School year 1993–94**

Class subject	Percentage of students eligible for free or reduced-price lunch			
	0–5	6–20	21–40	41–100
Did not major in class subject				
English	17.5	23.4	26.4	28.8
Social sciences	11.0	13.3	15.9	19.5
Mathematics	26.7	28.4	34.7	39.9
Science	16.3	18.0	18.0	26.2
Foreign languages	19.6	15.9	25.5	17.9
Visual and performing arts	10.3	12.1	18.5	14.9
Health and physical education	8.8	8.4	9.2	10.1
Vocational education	16.4	17.4	18.4	21.6
Did not major or minor in class subject				
English	11.6	17.3	16.1	18.5
Social sciences	8.2	6.0	8.5	12.8
Mathematics	16.7	20.3	23.9	25.9
Science	8.0	9.9	8.5	13.5
Foreign languages	10.6	8.8	13.7	12.0
Visual and performing arts	9.8	10.8	16.1	14.4
Health and physical education	6.1	7.3	6.6	7.3
Vocational education	14.5	15.8	17.7	19.4
Not certified in class subject				
English	6.0	8.8	10.1	13.2
Social sciences	7.7	12.2	10.6	13.9
Mathematics	10.7	12.4	14.0	21.2
Science	6.9	5.7	11.2	13.4
Foreign languages	12.8	9.1	12.6	16.6
Visual and performing arts	7.5	12.2	13.1	16.1
Health and physical education	6.5	8.8	8.5	10.4
Vocational education	9.5	10.9	13.2	13.0

NOTE: See the supplemental note to this indicator for the definition of student percentages, certification in class subject, and major/minor in class subject.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1993–94 (Public School Teacher Questionnaire).

Table 58-2 Percentage of secondary students in selected subjects taught by teachers without selected qualifications, by control of school, percentage of minority students enrolled in school, and class subject: School year 1993–94

Class subject	Public				Private			
	0–4	5–19	20–49	50–100	0–4	5–19	20–49	50–100
Did not major in class subject								
English	21.9	20.9	26.5	28.3	19.5	26.0	27.1	36.0
Social sciences	14.0	13.2	15.8	15.7	4.4	19.7	4.1	(*)
Mathematics	25.4	28.6	34.4	39.1	23.2	41.3	37.1	40.6
Science	18.6	12.9	21.7	23.3	16.8	11.6	19.4	(*)
Foreign languages	18.5	19.9	22.2	13.3	29.1	34.7	29.2	(*)
Visual and performing arts	10.8	12.8	13.3	20.5	9.5	23.6	13.5	(*)
Health and physical education	9.0	7.5	8.7	9.8	(*)	13.6	19.9	(*)
Vocational education	13.8	16.8	22.7	26.6	25.7	40.2	(*)	(*)
Did not major or minor in class subject								
English	15.8	14.0	18.1	17.4	12.9	23.1	21.1	27.8
Social sciences	7.3	7.2	8.1	10.4	3.6	15.6	2.6	(*)
Mathematics	18.0	19.3	22.3	27.7	17.3	31.8	28.6	38.1
Science	9.1	6.9	12.1	11.2	7.5	6.6	11.3	(*)
Foreign languages	7.7	11.1	14.3	8.7	23.2	27.0	21.6	(*)
Visual and performing arts	10.2	11.3	12.0	18.6	8.8	20.2	7.7	(*)
Health and physical education	6.4	5.5	6.9	8.4	(*)	13.6	11.1	(*)
Vocational education	11.7	15.8	21.7	22.1	24.5	40.2	(*)	(*)
Not certified in class subject								
English	7.9	7.9	10.2	12.3	20.7	37.9	38.9	43.5
Social sciences	10.0	9.2	13.9	12.7	21.2	40.3	27.5	(*)
Mathematics	10.3	12.6	13.7	20.9	39.6	43.5	51.6	59.4
Science	7.4	7.3	6.7	14.5	16.3	23.8	54.7	(*)
Foreign languages	8.6	10.9	11.5	15.1	43.7	44.3	50.0	(*)
Visual and performing arts	10.4	12.0	12.3	16.6	28.8	50.0	34.6	(*)
Health and physical education	7.7	7.7	8.4	9.6	(*)	35.1	33.7	(*)
Vocational education	10.4	9.4	14.2	12.4	25.9	43.7	(*)	(*)

* Too few sample observations for a reliable estimate.

NOTE: See the supplemental note to this indicator for the definition of student percentages, certification in class subject, and major/minor in class subject.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1993–94 (Public and Private School Teacher questionnaires).

Note to Indicator 58: Definition of student percentages, certification in class subject, and major/minor in class subject

Indicator 58 reports the percentages of students taught by full-time teachers who had not majored or minored or become certified in the subject field that they were teaching. These values were calculated from Schools and Staffing Survey Public and Private School Teacher questionnaire information on the number of classes teachers taught, the number of students the teachers had in each class, the subject matter taught in each class, and the teachers' education and certification. The information obtained from each teacher was weighted to properly represent national levels.

For example, the following procedure was used to calculate the percentage of mathematics students taught by non-certified mathematics teachers. First, for each full-time teacher who reported teaching a mathematics class, the weighted number of students in each class was summed to get an estimate of the total number of mathematics students who were taught by these teachers. Next, for each full-time teacher who was not certified to teach mathematics, the weighted number of students in each mathematics class was summed to get an estimate of the number of mathematics students taught by non-certified teachers. Finally, the estimated number of mathematics students taught by non-certified teachers was divided by the estimated total number of mathematics students. The percentages reported in each of the tables in this analysis were calculated by limiting the selection to specific subjects and specific school and teacher characteristics.

There are many ways to match a major/minor field of study with a class subject. One method is to include both the general or specific field and the education major/minor parallel field as a match for a specific class subject. For example, a general definition of a teacher who majored or minored in mathematics or mathematics education could be defined as having majored or minored in the subject of mathematics. A more strict definition would exclude the mathematics teachers who majored or minored in mathematics education. The more general definition is used for all the core subjects in all the tables in this analysis.

Class subjects excluded from the text table and supplemental tables

Some classes are excluded from this analysis because it was difficult to match each class subject

matter to the appropriate major/minor, or as in the case of computer science, a major/minor in the field has existed for only a few years. The following subject matters were excluded from the tables in this analysis: computer science, driver education, religion, philosophy, and unspecified.

Certification in class subject

Certification in this analysis is defined as having advanced, standard, or probationary certification by a state or a full certification by an accrediting body other than a state. Teachers with a temporary or emergency certification were classified as not certified in this analysis.

The table below shows teacher certifications classified by class subject. Teachers were classified as being certified in a class subject if they were certified in an assignment field (shown in the right-hand column) that corresponds to the subject matter (listed in the left-hand column).

Class subject(s)	Certification in assignment field(s)
English	English/language arts, reading, bilingual education, English as a second language
Social sciences	Social studies/social sciences (including history), American Indian/Native American studies
Mathematics	Mathematics
Natural sciences	Geology/earth science, space science education, physical science, general science and all other sciences (e.g., biology/life science, chemistry, physics)
Foreign languages	French, German, Latin, Russian, Spanish, other foreign languages, English as a second language

Class subject(s)	Certification in assignment field(s)	Class subject(s)	Major/minor field(s)
Health and physical education	Health, physical education	Foreign languages	French, German, Latin, Russian, Spanish, other foreign languages, foreign language education, bilingual education, English as a second language
Vocational education	Accounting, agriculture, business, marketing, health occupations, industrial arts, trade and industry, technical, other vocational/technical education, home economics, journalism	Visual and performing arts	Art, dance, drama/theater, music
Majored or minored in class subject		Health, physical education	Health professions and occupations, physical education/health education
Teachers were classified as having majored or minored in a class subject if they majored or minored in a field (shown in the right-hand column) that corresponds to the class subject (listed in the left-hand column). Both undergraduate and graduate level degrees were considered in determining if a match had occurred.		Vocational education	Agricultural education, home economics education, industrial arts, vocational and technical, trade and industrial education, agricultural and natural resources, business and management, business, commerce, and distributive education, communications and journalism
Class subject(s)	Major/minor field(s)		
English	English/language arts, reading, bilingual education, English as a second language		
Social sciences	Social studies/social sciences education, cross-cultural education, area and ethnic studies, psychology, public affairs, economics, history, political science and government, sociology, other social sciences		
Mathematics	Mathematics, mathematics education, engineering, physics		
Natural sciences	Geology/earth science, science education, biology/life science, chemistry, and physics		

Table S58 Standard errors for the text table in *Indicator 58*

Control of school and class subject	Did not major in class subject	Did not major or minor in class subject	No graduate degree in class subject	Not certified in class subject
Public				
English	0.8	0.6	0.7	0.5
Social sciences	0.7	0.5	0.9	0.7
Mathematics	0.9	1.0	0.7	0.8
Science	1.0	0.6	1.1	0.7
Foreign languages	1.3	0.9	1.6	0.9
Visual and performing arts	0.9	0.9	1.3	1.0
Health and physical education	0.8	0.7	1.3	0.9
Vocational education	0.9	0.9	0.9	0.6
Private				
English	2.3	2.2	2.7	2.9
Social sciences	2.1	2.0	3.0	3.0
Mathematics	2.6	2.5	1.8	2.6
Science	1.6	1.1	2.9	2.3
Foreign languages	3.5	3.5	3.0	4.3
Visual and performing arts	2.3	2.3	4.1	4.6
Health and physical education	3.2	2.7	3.8	3.8
Vocational education	6.6	6.5	4.1	7.1

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1993–94 (Public and Private School Teacher questionnaires).